FLUID-ENERGY MILL

ABSTRACT

A fluid-energy mill for size reduction of a material includes a manifold defining a grinding chamber having a first radius extending from a center of the grinding chamber, a gas inlet, a feed inlet, and an outlet. The feed inlet is positioned such that the material enters the grinding chamber tangent to a second radius extending from the center and larger than the first radius. The fluid-energy mill includes a cover for enclosing the grinding chamber. The manifold defines a non-circular groove around the grinding chamber, and a seal is positioned within the groove. The grinding chamber is cycloid-shaped. The manifold defines a protective pocket and a barrier at a region where the material enters the grinding chamber. The feed inlet includes a feed gas inlet, a material funnel, and a venturi. An intersection of the feed gas inlet and the material funnel form an elliptical hole. The feed inlet is oriented at an angle of about 30 degrees or more to a horizontal. The gas inlet is positioned such that a gas enters the grinding chamber tangent to a radius that is smaller than the radius of the grinding chamber. The outlet is positioned so that the material exits the grinding chamber at or near the center of the chamber. The manifold is a one-piece manifold.